UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,070	02/25/2004	Andrew B. Kahng	0321.67421	2850

24978	7590	11/02/2005

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EXAMINER
LIN, SUN J

ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>2</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*25 February 2004*</u>.

2a)☐ This action is **FINAL**.   2b)☐ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-38* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>*7/19/2004*</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>*08/18/04*</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

1.   This office action is in response to application 10/787,070 filed on 02/25/2004.
Claims 1 – 38 remain pending in the application.

QUAYLE ACTION

2.   This application is in condition for allowance except for the following formal
matters:

Specification Objections

Page 5, line 7, change "$\mu_{1+2}+k\sigma_{1+2}$" to — $\mu+k\sigma$ —.

Page 17, line 3, change "the design layout" to —**a mask design layout**—.

Page 17, line 4, before "design" insert —**mask**—.

Page 17, line 4, change "the determined" to —**a determined**—.

Page 17, line 6, before "design" insert —**mask**—.

Page 17, line 6, change "the desired" to —**a desired**—.

Page 17, line 7, before "total" delete —**the**—.

Page 17, line 7, before "design" insert —**mask**—.

Similar informalities listed in "Claim Objections" given below.

Drawing Objections

Fig. 1, between "Box 12 and EXIT" label —**YES**—.

Fig. 1, between "Box 12 and BOX 14" label —**NO**—.

Fig. 2 should be labeled as —**(PRIOR ART)**—.

Claim Objections

Claim 1, line 3, change "the mask design" to —a mask design—.

Claim 2, line 1, change "said first" to —**a first**—.

Claim 10, line 3, change "$\mu_{1+2}+k\sigma_{1+2}$" to — $\mu+k\sigma$ —.

Claim 10, line 4, delete — **where $\mu+k\sigma$** —.

Claim 10, line 4, change "μ is the mean" to —μ_i **is a mean**—.

Claim 10, line 4, provide clear definition of k and its range..

Claim 10, line 4, change "σ is the standard deviation" to — **σ_i is a standard deviation**—.

Claim 10, line 5, change "μ+kσ" to — **μ_i+k σ_i** —.

Claim 10, line 5, after "yield" insert —**, for all i = 1, 2** —.

Claim 13, line 1, after "is" delete —**a**—.

Claim 16, line 3 – 4, change "the circuit" to —**a circuit**—.

Claim 16, line 6, after "cost;" insert —**and**—.

Claim 16, line 7, after "based" insert —**on**—.

Claim 16, line 9, change "a minimum" to —**said minimum**—.

Claim 19, line 2, before "output" insert —**the**—.

Claim 19, line 4, delete —**determined**—.

Claim 19, line 7, after "second" delete —**first**—.

Claim 19, line 9, change "a minimum" to —**said minimum**—.

Claim 19, line 11, change "a minimum" to —**said minimum**—.

Claim 21, line 3, change "μ_{1+2}+kσ_{1+2}" to — **μ+kσ** —.

Claim 21, line 4, delete — **where μ+kσ** —.

Claim 21, line 4, change "μ is the mean" to —**μ_i is a mean**—.

Claim 21, line 4, provide clear definition of k and its range.

Claim 21, line 4, change "σ is the standard deviation" to — **σ_i is a standard deviation**—.

Claim 21, line 5, change "μ+kσ" to — **μ_i+k σ_i** —.

Claim 21, line 5, after "yield" insert —**, for all i = 1, 2**—.

Claim 24, line 1, after "is" delete —**a**—.

Claim 27, line 6, before "each" delete —**said**—.

Claim 27, line 10, after "within" insert —**a**—.

Claim 28, line 1, before "each" delete —**said**—.

Claim 31, line 2, change "the mask" to —**a mask**—.

Claim 31, line 4, change "the determined" to —**a determined**—.

Claim 31, line 5 delete —**on the medium**—.

Claim 32, line 3, change "μ_{1+2}+kσ_{1+2}" to — **μ+kσ** —.

Claim 32, line 4, delete — **where μ+kσ** —.

Claim 32, line 4, change "μ is the mean" to —**μ_i is a mean**—.

Claim 32, line 4, provide clear definition of k and its range.

Claim 32, line 4, change "σ is the standard deviation" to — σ_i **is a standard deviation**—.

Claim 32, line 5, change "μ+kσ" to — μ_i+k σ_i —.

Claim 32, line 5, after "yield" insert —**, for all i = 1, 2**—.

Claim 33, line 5, delete —**on the medium** —.

Claim 34, line 4, change "the circuit" to —**a circuit**—.

Claim 34, line 6, after "based" insert —**on**—.

Claim 34, line 6 – 7, change "said" predetermined" to —**a predetermined**—.

Claim 37, line 3, change "μ_{1+2}+kσ_{1+2}" to — **μ+kσ** —.

Claim 37, line 4, delete — **where μ+kσ** —.

Claim 37, line 4, change "μ is the mean" to —μ_i **is a mean**—.

Claim 37, line 4, provide clear definition of k and its range.

Claim 37, line 4, change "σ is the standard deviation" to — σ_i **is a standard deviation**—.

Claim 37, line 5, change "μ+kσ" to — μ_i+k σ_i —.

Claim 37, line 5, after "yield" insert —**, for all i = 1, 2**—.

Appropriate corrections are required.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Reasons for Allowance

3.   The following is an examiner's statement of reasons for allowance:

Claims 1 – 38 are allowed because the prior art does not teach or fairly suggest the following subject matter:

- A method for performing a mask design layout resolution enhancement comprising *determining a first level of correction for a mask design layout for a predetermined parametric yield with a minimum total correction cost* in combination with other limitations as recited in independent **Claim 1**;
- A method for minimizing a cost of correction of a mask design layout

comprising a _correction the mask design layout at a first level of correction of_
based on a correction algorithm if a first probability density function obtained
for a signal arrival time at an output of a circuit on the mask layout does not
_satisfy a predetermined parametric yield with a minimum total correction cos_t
in combination with other limitations as recited in independent **Claim 16**;

- A method for performing a mask design layout resolution enhancement
comprising _determining a an edge placement error (EPC) tolerance_
corresponding to a critical dimension (CD) variation tolerance for each of a
plurality of features in the mask design layout and correcting each of the
plurality of features so that at least one edge on the each of said plurality of
features prints within a tolerance based on said EPE tolerance in combination
with other limitations as recited in independent **Claim 27**;

- A machine readable medium for storing _a program in a system for performing_
a mask design layout resolution enhancement in which a level of correction
for a mask design layout for a predetermined parametric yield with a minimum
total correction cost in combination with other limitations as recited in
independent **Claim 31** and **Claim 33**, respectively;

- A system for minimizing a cost of correction of a mask design layout
comprising a _correction means for determining a first level of correction of the_
mask design layout based on a correction algorithm if a first probability
density function obtained by an analyzing means does not satisfy a
_predetermined parametric yield with a minimum total correction cos_t in
combination with other limitations as recited in independent **Claim 34**.

Any comments considered necessary by applicant must be submitted no later
than the payment of the issue fee and, to avoid processing delays, should preferably
accompany the issue fee. Such submissions should be clearly labeled "Comments on
Statement of Reasons for Allowance".

Conclusion

4.   Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Sun J Lin whose telephone number is (571) 272 - 1899.
The examiner can normally be reached on Monday-Friday 9:30AM - 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on (571) 272 - 1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sun J. Lin
Patent Examiner
Art Unit 2825
October 27, 2005